

# EARLY MEDIEVAL LATIN ADAPTATIONS OF BYZANTINE MEDICINE IN WESTERN EUROPE

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If one surveys the state of medical knowledge in late antiquity and in the early Middle Ages in western Europe, it is deplorable. Greek scholarship had vanished in most of Italy.<sup>1</sup> By the fifth century, the attempt to establish a medical literature in Latin, on a level comparable to that of the second century (in Greek), had failed. Technical medical texts, as contrasted to those written in Vulgar Latin,<sup>2</sup> had little influence. The so-called African medical writers are not representative: the standards are not, for example, Caelius Aurelianus, but anonymous Vulgar Latin texts, full of superstition and folk medicine, suggestive of this time of crisis for the Roman Empire in the West, growing in intensity since the third century. Generally, one can say that after the loss of knowledge of Greek in medicine during the fifth and especially the sixth century, doctors who knew a little Greek translated—into Vulgar Latin—medical tracts for their colleagues who knew no Greek nor any medical works. The so-called Lombard medical literature was created by these northern Italian translators, at the court of Theodoric and in nearby locations.<sup>3</sup> This is the overwhelmingly popular medical literature of the time and of the early Middle Ages.

[The reader is referred to the list of abbreviations at the end of the volume.]

<sup>1</sup> For the decline of Greek scholarship in Italy generally from the fifth century, see P. Courcelle, "Les Lettres grecques en occident de Macrobe à Cassiodore," *BEFAR*, 159 (1948), 129–36; see also G. Baader, "Zu den Aufgaben der medizinhistorischen Forschung auf dem Gebiet der Geschichte der mittelalterlichen Medizin in der Gegenwart," *Actes du XXVI<sup>e</sup> Congrès International d'Histoire de la Médecine* (Plovdiv, 20–25 août 1978), I (Sofia, 1980), 85–88.

<sup>2</sup> G. Baader, "Lo sviluppo del linguaggio medico nell'antichità e nel primo medioevo," *AR*, n.s. 15 (1970), 1–19 (esp. 6 f.).

<sup>3</sup> *Ibid.*, 10 f. See also I. Mazzini, "Il latino medico in Italia nei secoli V e VI," *La cultura in Italia fra Tardo Antico et Alto Medioevo: Atti del Convegno tenuto a Roma . . . del 12 al 16 Novembre 1979* (Rome, 1981), 433–41.

Most of the important medical works of antiquity, from the Hippocratic corpus to Galen, had not been translated. An exception was Dioscorides, but this resulted in no widespread tradition.<sup>4</sup> This can also be said about two treatises of the Hippocratic corpus, found in the Codex Ambrosianus G 108 inferior, originally written in Ravenna, or in the Codex Parisinus Latinus 7027, also of Italian origin, or in a Fulda manuscript, today in the Library of Bodmer.<sup>5</sup> From the Hippocratic corpus, one finds a single tract with a truly widespread tradition, that is, the Hippocratic *Aphorisms* and Galen's commentary on them,<sup>6</sup> and sometimes Byzantine commentaries on the *Aphorisms* appear to have taken the place of Galen. Regarding Galen's works, the same state existed for them as for the Hippocratic corpus:<sup>7</sup> their tradition is also limited to the Milan manuscript.

This Milanese manuscript is of great importance, since it not only contains early translations of Galen, but it also has Byzantine commentaries on those works, compiled by the iatrosophist Agnellus, and translated by Simplicius in Ravenna during the sixth century. Although these Byzantine commentaries are found only in the Milan manuscript, they provide hints of the important Byzantine influence one must consider for northern Italy and occasionally France in the sixth century. This links with other evidence. One finds the Byzantine physician Anthimus as an immigrant at

<sup>4</sup> G. Baader, "Die Anfänge der medizinischen Ausbildung im Abendland bis 1000," *Settimane di studio del Centro Italiano di studi sull'alto medioevo*, 19 (1971), 669–742 (esp. 691).

<sup>5</sup> *Ibid.*, 685–87, and I. Mazzini, "De observantia ciborum: Un'antica traduzione latina del pseudo-ippocratico (I.II) (editio princeps)," *Romanobarbarica*, 2 (1977), 287–93.

<sup>6</sup> Baader, "Anfänge" (n. 4 above), 687–89.

<sup>7</sup> Cf. A. Beccaria, "Sulle tracce di un antico canone latino di Ippocrate e di Galeno I.II," *Italia medioevale e umanistica*, 2 (1959), 1–56, and 4 (1961), 1–75.

the court of Theodoric.<sup>8</sup> He had to flee from the court of Zeno to Ravenna due to his traitorous dealings with the Franks. In France, a physician named Reovalis, who had been trained in Constantinople, is mentioned as being at Poitiers in 590, the episcopal seat,<sup>9</sup> but he appears to have been an exception in this region. Anthimus wrote a short tract to Theodoric, *De observatione ciborum*, in the Vulgar Latin of the day, which was full of Hellenisms but also replete with German words.<sup>10</sup> One may presume Galen and Dioscorides as sources for Anthimus, but Byzantine medical writers do not seem to have been employed by him.

More important than Anthimus were the translations of ancient medical compendia, especially those compiled by Oribasius in the fourth century in Constantinople, and by Alexander of Tralles, who practiced medicine in Rome during the second half of the sixth century. The influence of Byzantine medicine in early medieval Europe<sup>11</sup> is illustrated by the two sixth-century translations of Oribasius produced in northern Italy, at Ravenna or at a location nearby. Although the older translation is included in two manuscripts, dating from the end of the sixth century or the beginning of the seventh (originating in Italy), and in one Fleury manuscript dating from the end of the eighth or the beginning of the ninth century (which was later in Chartres), traces of this older translation are rare: besides excerpts in a St. Gall manuscript of the ninth century, one can only suppose that the *editio princeps* of Schott goes back to an earlier manuscript that is no longer extant. The second translation, conjectured by Mørland as also of the sixth century,<sup>12</sup> was apparently more influential: eight manuscripts (dating from the ninth through the twelfth centuries, as well as a few of later date), from Italy, France, and Germany, show that it had been copied several times. Nevertheless, its influence was minimal: one finds only traces of its use in medical glossaries of the early Middle Ages,<sup>13</sup> but no traces of the second translation of Oribasius are found in the Latin compendia of this era. The

influence of Alexander of Tralles seems to be stronger, but only in certain respects. The translation of his compendium is contained *in toto* in a French manuscript from Angers, in one of Cassinese origin, and in the Fleury manuscript (which also has the older translation of Oribasius), and the impact of Alexander was more significant than that of Oribasius: Alexander's dietetics had become integrated into the main corpus of tradition by which ancient dietetics were transmitted to the early Middle Ages.<sup>14</sup> Even so, the influence of Alexander of Tralles was indirect, and dietetics was but a small portion of the transmitted material.

Regarding Paul of Aegina, the third book of his medical encyclopedia was translated into Vulgar Latin during the sixth century in northern Italy.<sup>15</sup> The influence, however, either of Paul's third book or of his sixth, the famous *Surgery*, was almost negligible. It was not translated into Latin in late antiquity or early medieval times, and Paul had no direct influence comparable to Oribasius or Alexander of Tralles. Thus it is not surprising that in the actual surgery of early medieval Europe none of the instruments and difficult procedures in surgery described by Paul was known. In the West, operations are limited to cauterization, bloodletting, the excision of polyps and removal of hemorrhoids, and perhaps sometimes depressing cataracts, as known through literary and iconographic sources.<sup>16</sup>

In summarizing these traces of Byzantine medicine in sixth-century northern Italy, one fact needs emphasis: no Byzantine medical writings of significant originality were translated into Vulgar Latin, and these are the treatises which Temkin has characterized as having a new combination of empiricism and tradition.<sup>17</sup> What was translated were two kinds of Byzantine medical treatises. First were commentaries on important works of ancient medicine, usually written by the so-called iatrosophists, and these tracts frequently are scholastic and stiff. Latin translations of such commentaries were limited (if one omits the single instance of the Hip-

<sup>8</sup> Anthimus (ed. Liechtenhan), preface, ix f.

<sup>9</sup> G. Baader, "Gesellschaft, Wirtschaft und ärztlicher Stand im frühen und hohen Mittelalter," *Medizinhistorisches Journal*, 14 (1979), 176–85 (esp. 179).

<sup>10</sup> Baader, "Sviluppo" (n. 2 above), 11 f.

<sup>11</sup> Baader, "Anfänge" (n. 4 above), 689–91; and G. Baader and G. Keil, *Medizin im mittelalterlichen Abendland* (Darmstadt, 1982), 12 (Einleitung).

<sup>12</sup> Cf. H. Mørland, "Die lateinischen Oribasiusübersetzungen," *SOsI*, suppl. 5 (Oslo, 1932), 43–51.

<sup>13</sup> *Glossae medicales* (ed. Heiberg), e.g., 5, 3–6; 10, 4–5, etc.

<sup>14</sup> A. Beccaria, *I codici di medicina del periodo presalernitano (secoli IX, X e XI)*, *Storia e letteratura* 53 (Rome, 1956), 468. An edition of this text is in preparation by M. Machleb (Med. diss., Berlin). The dietetic corpus generally will be analyzed by F.-D. Groenke in his Med. diss. (Berlin) on the dietetic calendars of the early Middle Ages.

<sup>15</sup> Baader, "Sviluppo" (n. 2 above), 13.

<sup>16</sup> Baader, "Anfänge" (n. 4 above), 700 f.

<sup>17</sup> O. Temkin, "Byzantine Medicine: Tradition and Empiricism," *DOP*, 16 (1962), 97–115 (esp. 97) = *Double Face of Janus*, 202.

pocratic *Aphorisms*) to the Milanese manuscript. Secondly, there were compendia of ancient medical writings, never quite independent from their sources, but which show their differences each through their author's own style. Although the traditions of these translated compendia are more widespread than those of the commentaries, their influence is limited, and their only importance lies in parts incorporated into the corpus of tradition (for example, medical dietetics) for the process of transmission of medical knowledge in the early Middle Ages.

The popular medical literature of early medieval Europe includes two other kinds of Byzantine medical tracts—translated or rewritten into Latin—the newly enlarged versions of important ancient medical works, which had close connections with the commentaries, and short manuals from Byzantine sources which, in their original form, had been abridged into epitomes and condensations, shorn of theory.

One may illustrate the first of these two other kinds of Byzantine medical tracts with the only translation of a Galenic work that had any real impact in the early Middle Ages, Galen's *Therapeutics for Glaucôn*. Mentioned by Cassiodorus, this treatise is part of a corpus of tradition of six books, and became one of the most popular guides to therapy in early western medieval Europe.<sup>18</sup> Yet only the first chapter of the first book shows that it is a loose translation of Galen's writing, and the remaining chapters have no relation at all to the purported Galenic original. These chapters are nothing more than part of an enlarged version of the Latin translation—but not of Galen. Their origins, however, may be discerned; for example, chapter 52, "On the Four Stages of the Origin of the Fevers," is an enlarged version of the preface *ante rem* of a Byzantine manual on pulse and urine by an otherwise unknown Alexander.<sup>19</sup> Having mentioned the kinds and stages of the fevers, Alexander lists the signs that must be known for a correct prediction of the course of the diseases followed by fever, for instance the pulse or urine, as well as the influence of the climate and region, as known from Hippocrates. At the end of the preface, without any connection with the preceding text, Alexander says that to give drugs at the right moment will ensure suc-

cess in therapy. This is the major point of Galen's Byzantine compiler: he employs the parts of the preface of the unknown Alexander to stress that the knowledge of the four stages of fevers is the basis of every efficient therapy. Such examples show not the Galenic original, but an enlarged Byzantine version translated into Vulgar Latin in sixth- and seventh-century northern Italy. This is nothing more than a Byzantine adaptation of Galen's doctrines, which have been transmitted in this form by such tracts into western Europe. The widespread tradition of this treatise, incorporated into a cohesive corpus of writings on therapeutics, indicates that this expanded Latin version of a presumably Galenic tract was an important textbook of therapy in the early Middle Ages.

The second kind of Byzantine medical tract appropriated for an unsophisticated medical practice in the early medieval West was the Byzantine medical manual, which had been previously reduced to an epitome and shorn of theory. This form is typical of many diagnostic—or, more accurately, prognostic—texts in numerous Latin manuscripts which, in turn, have separate parts with their own textual traditions,<sup>20</sup> or which became incorporated into the body of didactic letters and short didactic treatises, also possessing textual traditions of their own.<sup>21</sup> One may refer again to the Byzantine tract *On Pulses and Urines* by the unknown Alexander, which had been translated twice into Vulgar Latin in the early Middle Ages.<sup>22</sup> Sphygmology had been a prominent and sophisticated method of prognosis and diagnosis in the medical works up to the end of the second century,<sup>23</sup> as suggested by the important works by Galen on the subject.<sup>24</sup> None of these tracts was translated into Latin, as contrasted to the short manual on urine by Alexander, which is arranged according to the fevers and the

<sup>20</sup>G. Baader and G. Keil, "Mittelalterliche Diagnostik: Ein Bericht," in C. Habrich, F. Marguth, and J. H. Wolf, eds., *Medizinische Diagnostik in Geschichte und Gegenwart. Festschrift für Heinz Goerke zum 60. Geburtstag* (Munich, 1978 [Neue Münchner Beiträge zur Geschichte der Medizin und Naturwissenschaften: Medizinhistorische Reihe, 7/8]), 124–29.

<sup>21</sup>W. Wiedemann, *Untersuchungen zu dem frühmittelalterlichen medizinischen Briefbuch des Codex Bruxellensis 3701–15* (Med. diss., Berlin, 1976), 46–81; and V. Scherer, *Die "Epistula de ratione ventris vel viscerum": Ein Beitrag zur Geschichte des Galenismus im frühen Mittelalter* (Med. diss., Berlin, 1976), 13–30a.

<sup>22</sup>Stoffregen, *Alexandros* (n. 19 above), 24–59.

<sup>23</sup>Baader and Keil, "Diagnostik" (n. 20 above), 122; and J. A. Pithis, *Die Schriften Περὶ σφυγμῶν des Philaretos: Text-Übersetzung-Kommentar* (Husum, 1983 [Abh. zur Geschichte der Medizin und Naturwissenschaften, 46]), 11–30.

<sup>24</sup>Stoffregen, *Alexandros* (n. 19 above), 147–50; and Pithis, *Philaretos* (n. 23 above), 27–31.

<sup>18</sup>Baader, "Anfänge" (n. 4 above), 694–97.

<sup>19</sup>M. Stoffregen, *Eine frühmittelalterliche Übersetzung des byzantinischen Puls- und Urintrakts des Alexandros: Text-Übersetzung-Kommentar* (Diss. med., Berlin, 1977), 137–46.

individual diseases. Although it seems to follow the pattern of almost every ancient medical manual (for example, the pseudo-Galenic *Medical Definitions*) in its ordering from “head to toe” and the distinctions between acute and chronic diseases, *On Pulses and Urines* does not reproduce the pattern generally employed in the earlier Greco-Roman manuals.<sup>25</sup> One can understand why Alexander did not use Galen’s books on the pulse: they were heavily theoretical.

Alexander based his manual on Galen’s isagogic treatises, such as *On Pulses for Beginners* and mainly on *Therapeutics for Glaucon*. Alexander’s methodology can be seen in the first chapter of his tract, almost nothing more than an excerpt taken from the second chapter of the first book of Galen’s *Therapeutics for Glaucon*. Galen’s textbook was mainly oriented towards the clinic, but Alexander made extracts from it only as it referred to the semiotics of the pulse. Every theoretical concept is missing—for example, the lore of the different mixtures of the humors. Yet Alexander is following the different descriptions of illness and the pulses which are typical for them, so that in descriptions of the pulses, Alexander quite often alters Galen, particularly when Alexander adds short definitions of the pulses, found nowhere in Galen, not even in the isagogic textbook *On Pulses for Beginners*.<sup>26</sup> In *Therapeutics for Glaucon*, Galen says that the daily fevers show an equality in the extent, in the density, and in the velocity of their pulses, calling this kind of pulse *σύμμετρος*, that is, balanced in its three dimensions, length, breadth, and depth. These pulses, therefore, are the simplest ones. In Alexander, this pulse is called “simple,” and he gives a definition of this simple pulse wrenched from its context, not found anywhere in the works of Galen. This simple pulse is introduced again in the expanded version of Galen’s *Therapeutics for Glaucon*, as we see it in the Latin translation.<sup>27</sup> Similarly, Alexander speaks about an unequal pulse. In Galen one reads that a pulse has an inequality according to certain features of its extent, its velocity, its dimness, and its density in comparison to its beat.<sup>28</sup> At the end of the chapter, however, Alexander shows he has not understood Galen at all: Galen had written (as adapted also by Alexander) that red

urine is typical of the daily fevers, but at the end of the first chapter Alexander says that nearly white urine is typical of the daily fevers. In Galen one reads that this nearly white urine is only typical of the daily fever that follows bubo, and in every daily fever it is the equality of the pulse that is typical for each of them. By omitting the last word, *ὁμαλότης*, Alexander has misunderstood the whole sentence.<sup>29</sup> In the second chapter of his *On Acute Fevers*, Alexander uses Galen’s terminology, if he takes steady (*συνεχής*), and acute as synonyms. In a similar way, Galen uses *ὁμότονος*, “having the same force,” and *ἀκμαστικός*, “vigorous at its climax,” as synonyms for the unremitting fever. Alexander distinguishes between *ἀκμαστικός*, *ὁμότονος*, and *παρακμαστικός*, “after the climax,” with definitions that cannot be found in Galen. Such definitions and distinctions are not only in Alexander, but also in other Byzantine texts, for example, the treatise on fevers by Pseudo-Philoponus in the Codex Mosquensis 466 (fol. 161<sup>v</sup>), where the acmastic, the homotonous, and the paracmastic fevers are distinguished.<sup>30</sup> The detailed and sophisticated differentiations with no intention of application to practice and bereft of any new observations, coupled with the loss of the theoretical basis found in Galen, are typical elements in such Byzantine manuals. In their condensed form, these manuals were designed for reception by the unsophisticated medicine of western Europe in this era.

These characteristics are even more prominent in the second part of the tract, which considers urine. Among Galen’s writings, there is none on urine: all tracts on urine included by Chartier and Kühn in their editions of Galen are spurious.<sup>31</sup> The hints one finds in the Hippocratic writings on the prognostic importance of urine refer only to single and specific descriptions of diseases,<sup>32</sup> and they are not part of a sophisticated system, as had been the case with Galen’s pulse lore. After Galen’s time, however, pulse was replaced by urine as employed in the practice of prognosis. It is only then that one finds for the first time in Byzantine medical writers separate treatises dealing with urine. Magnus, Theophilus Protospatharius, and Stephen of Athens show a systematic urine lore. Urine physiology was based upon humoral pathology, especially the

<sup>25</sup> Stoffregen, *Alexandros* (n. 19 above), 151.

<sup>26</sup> *Ibid.*, 153–61.

<sup>27</sup> *Ibid.*, 156.

<sup>28</sup> *Ibid.*, 155 f.

<sup>29</sup> *Ibid.*, 163 f.

<sup>30</sup> *Ibid.*, 164 f.

<sup>31</sup> Baader and Keil, “Diagnostik” (n. 20 above), 123.

<sup>32</sup> *Ibid.*, 122.

notion of concoctions, which underpinned the theory of its ἀποστάσεις, which are distinguished according to the colors of the urine, its consistency and its insoluble precipitates, characterized as *hypostaseis*, *enaioremata*, and *nephelai*, to which the sense of smell was added as a tool in medical diagnostics.<sup>33</sup>

In addition to this sophisticated urine lore, one soon finds in Byzantine medical writing short epitomes of urology, probably used for an unsophisticated diagnostics. These are either anonymous or ascribed to Galen, and include little more than clipped information on the color of the urine, its *hypostaseis*, clouds found in it, criteria of similarity to other urines, and whether such signs are constant or not. With such criteria as are associated with diseases accompanied by fevers (or not), one could make diagnoses for headache, phthisis, elephantiasis, pneumonia, liver complaints, and podagra; or one could predict if an illness would be lengthy or might end in death.<sup>34</sup>

Standing between these simple epitomes of urine lore and the scientific and theoretical tracts on urine, are the Byzantine manuals on urine which omit a detailed uroscopy; typical of these is Theophilus. Although the colors of the urine, its compactness and its insoluble parts are treated in more detail than in the epitomes on urine, these manuals are closer than the scientific compendia to the lower levels of medical prognosis. For if one compares the manuals with the sophisticated compendia, they show a loss of pathophysiology; if, on the other hand, one compares them with the clipped epitomes on urine, one does not find any hint of the process and consequence of the disease, characteristic in the urine epitomes.<sup>35</sup>

It is significant that in early medieval Europe, none of the elaborate compendia on urine were translated or adapted. Only manuals and epitomes on urine are found as parts of the prognostic corpora of the tradition. Worse, in contrast to Byzantium, no compendium with theoretical pathophysiology was available. In the East, if a physician used urine epitomes in his practice, compendia were available for further information. In western Europe, only manuals with reduced theory were at hand. Such a manual is the second part of the

translation by the unknown Alexander of the tract on pulses and urines. Although one finds an arrangement according to the fevers in the first chapter, as well as prognostic method using uroscopy, urine lore occupies a secondary role. Beyond the second chapter, especially in the second part of the tract arranged according to diseases, uroscopy receives the primary function. Although Alexander attempts to compose a manual on pathological diagnostics by arranging the single chapters according to individual diseases, he cannot substantiate his claim to a more theoretical view of uroscopy: these chapters are more similar to the urine epitomes than to the scientific tracts on the subject. One example will illustrate the manner of abridgment. One reads in Galen that black and livid urine is a bad sign because of its coldness, based upon humoral pathology; in Alexander, one reads only that livid urine indicates a worsening<sup>36</sup> of the headache, in the same manner as he has said in the chapter on acute fevers that black or livid urine is a bad sign.<sup>37</sup>

One finds the same state in another medical treatise of early western medieval Europe: the so-called pseudo-Galenic urine lore. As we have it in Alexander, one must assume a Byzantine original, since in his prologue *praeter rem* the translator not only delivers a panegyric on Galen, but also says explicitly that he has translated this manual from the Greek into Latin.<sup>38</sup> At least the prologue *ante rem* appears to stem from a Byzantine Greek original, and the author of this pseudo-Galenic urine lore attempts to provide a theory of the urine's origin and its coction before giving practical instructions for uroscopy: one must observe the colors of the urine, its precipitates, whether the patient urinates with pain, and whether the patient has control of his urine. Here the author gives a superficial and shallow view of pathophysiology which has no connection whatever with the actual contents of the tract. The work is nothing more than a collection of urine epitomes. The author focuses his attention only on an elaborate ordering of these summaries: twelve paragraphs of the preface are followed by twelve paragraphs which outline the colors of the urine. In the next twelve paragraphs, the author discusses exceptions that include apostema, syntexis or diseases of the brain or of the

<sup>33</sup> *Ibid.*, 122–24.

<sup>34</sup> Ideler, II, 304. Cf. Baader and Keil, "Diagnostik" (n. 20 above), 123 f.

<sup>35</sup> G. Keil, *Die urognostische Praxis in vor- und frühsalernitanischer Zeit* (Med. Hab. schr., Freiburg Br., 1970), 22 f.

<sup>36</sup> Stoffregen, *Alexandros* (n. 19 above), 199.

<sup>37</sup> *Ibid.*, 175.

<sup>38</sup> Keil, *Praxis* (n. 35 above), 23.

nerves, and the next twelve paragraphs abstract how one evaluates the colors of the urine, in turn followed by six paragraphs that deal with the precipitates of urine.<sup>39</sup> Generally, one can say that the main portion of this pseudo-Galenic urine lore is linked to an unlearned medical practice that lacks theoretical concepts. The tradition of this text is limited to two manuscripts of Italian origin dated in the end of the eighth or the ninth century.<sup>40</sup> Only in the more recent manuscript have four sections been added to the pseudo-Galenic urine lore, and these are generally identical with parts of Alexander's treatise.<sup>41</sup> With the ninth-century additions, the semiotics of fever have been introduced into the treatise, but in a very unrefined form. It appears that for this ninth-century material no Greek original can be assumed, as suggested by the confusing separation of a number of items from Alexander's ordering. For example, this is the case in the summary of acute fevers. Alexander says that in treating acute fevers, signs of impending death are white, spumous, or red urines, but that greater urine flow than usual, or watery urine, or nosebleed are signs of shivers. In the addition of the pseudo-Galenic urine lore, these two aspects are divided into two epitomes, whereby nosebleed is incorporated wrongly into the first abstract instead of the second.<sup>42</sup>

These rules of urine found here are not only part of Alexander's treatise, but also form the nucleus of the very widespread texts on uroscopy in early medieval western Europe, the so-called pseudo-Galenic rules of urine. Although there are parallels to Alexander, the later authors assume no theoretical foundations. The ordering of these rules is, therefore, very simple and schematic: after mentioning the leading symptom (for instance, for a fever), the author gives data on the urine, but before giving the prognosis, the author considers the accompanying symptoms.<sup>43</sup> As shown above, such rules of urine have their exact models in Byzantine medicine, and their Byzantine origin is without doubt. One can find these kinds of precepts on urine not only in Alexander, but also in other Byzantine Greek texts, as suggested previously. It is impossible, however, to delineate most of the urine rule tracts of this type which are found

in Latin manuscripts from the eighth to the fifteenth centuries—those that do not show any trace of Salernitan or post-Salernitan uroscopy, exactly parallel to that of Byzantium. Most of the later Byzantine texts remain unknown or have not been investigated. Yet one must assume that these urine rules, which were part of the usual manuals of uroscopy in early medieval western Europe, had been altered numerous times or that new rules had been added. These manuals bear witness to an unsophisticated and primitive practice of uroscopy in western Europe, unlike the level of uroscopy in Byzantine medicine. Among the Byzantines, there were always excellent tracts on uroscopy available, as well as the simplified manuals which were in common use.

Although uroscopy was the most important diagnostic method in the early Middle Ages, one can cite other diagnostic tools and texts of this era which were also Byzantine in their origin. Part of the tradition of the corpus of diagnostics is the *Capsula eburnea*, found also in the Corpus of tradition II, which likewise includes didactic letters and other short didactic tracts on medicine.<sup>44</sup> The Byzantine Greek original of the *Capsula eburnea* is known from several manuscripts, and Sudhoff published the text from the Codex Vindobonensis med. Graecus 8 of the fifteenth century.<sup>45</sup> In the preface, it is stated that this text was found in the tomb of Hippocrates, hidden in a casket made of ivory. This Byzantine legend precedes a prognostic text in which, for the first time, pathologic apostaseis (that is, nipples or cutaneous eruptions) are used to predict the course of the disease, or to predict death. In their patterns of simplicity, these maxims resemble the rules on urine. Having mentioned the leading symptom of the disease, the author adds the outer shape of the small blisters or blebs and other cutaneous eruptions, which can be identified without omitting the accompanying symptoms. At the end, the prognosis—death—is given. One finds a therapy only in a few cases. The *Capsula eburnea* was translated into Vulgar Latin, and it must have been greatly popular:<sup>46</sup> it shows a very widespread tradition which can be compared with the pseudo-Galenic rules on urine. In sixteen manuscripts, dating from the ninth to the eleventh century, it is

<sup>39</sup> *Ibid.*, 23–25.

<sup>40</sup> *Ibid.*, 32.

<sup>41</sup> Stoffregen, *Alexandros* (n. 19 above), 167–218 *passim*, and 223–25.

<sup>42</sup> *Ibid.*, 170 f.

<sup>43</sup> Keil, *Praxis* (n. 35 above), 32–40.

<sup>44</sup> Scherer, *Epistula* (n. 21 above), 14 f.

<sup>45</sup> K. Sudhoff, "Die pseudohippokratische Krankheitsprognostik nach dem Auftreten von Hautausschlägen, 'Secreta Hippocratis' oder 'Capsula eburnea' benannt," *SA*, 9 (1916), 79–116 (esp. 85 f., and 106–8).

<sup>46</sup> Baader and Keil, "Diagnostik" (n. 20 above), 124–26.

included or mentioned generally under the names of Hippocrates or Democritus.<sup>47</sup>

In a Corpus I of the manuscript tradition, containing mostly didactic letters and other similar short tracts, one finds a Latin pseudo-Hippocratic letter on hematoscopy,<sup>48</sup> also present in the Corpus II of the tradition of prognostic texts. This method of employing the visible state of the blood, gained through phlebotomy, to prognosticate the exit of a disease, also harkens back to Byzantine origins.<sup>49</sup> The extant text, however, does not represent a translation of a Greek original: it is an adaptation of this topic into the form of a didactic letter, written—as the language and Germanic words indicate—in the western Frankish kingdom during the seventh or eighth century.<sup>50</sup> The textual tradition of this pseudo-Hippocratic letter on hematoscopy is limited to two manuscripts of the ninth century.

The influence of Byzantine medicine in the West did not only have importance for commentaries on Hippocrates and Galen, or expanded revisions of their works or prognostic tracts, but that influence also was in the manner by which the Latin compendia had not adapted Byzantine medical works: in the short treatises that had made their way into the West, such as the rules for urine and urine lore, one may detect a role in the training of physicians in the monasteries and the primitive medical practice in those institutions.

One may notice dietetic tracts, arranged according to the order of the month, a pattern not found in the Greek medical literature earlier than Byzantine times.<sup>51</sup> Together with the dietetic excerpts of Alexander of Tralles, they had become part of the dietetic corpus of medical tradition, the most important dietetic texts of the early Middle Ages.<sup>52</sup> In this same tradition, which also includes the letter on hematoscopy, are found surgical texts which have their origins in Byzantine medicine. One of them is a list of surgical tools, and Bliquez has emphasized its Byzantine background.<sup>53</sup> The other is

a questionnaire under the title *Surgery of Heliodorus*,<sup>54</sup> having nothing to do with Heliodorus, but a textbook employed in the teaching of medicine. Such textbooks are known on the papyri from the second century and later, and in the Geneva Papyrus 111, one finds fragments of a textbook of surgery.<sup>55</sup> In addition to the Vulgar Latin, both Latin texts are so poor that very few could have used them. Thus one can address only the bookish tradition of these late Greek manuals: only a very few of the instruments used in Byzantine surgery have survived, and almost none of the surgical procedures described earlier seem to have been employed in early medieval western Europe. Within the listings and instruments described, one finds the lancet for bloodletting and the technique for bloodletting.<sup>56</sup> This important surgical technique is contained in a didactic letter on phlebotomy which shows a widespread textual tradition. Fifteen Latin manuscripts transmit this text anonymously under the names of Hippocrates, Galen, or Heliodorus,<sup>57</sup> and they date from the eighth through the eleventh century. In the textual traditions, the bloodletting letter is inserted into both Corpora I<sup>58</sup> and II<sup>59</sup> of the known didactic letters and short didactic tracts. The bloodletting letter is partially arranged by means of questions, in the manner of the *Surgery of Heliodorus*. One cannot, however, ascertain the direct Greek original from which this text had been rendered, although there are many Greek didactic letters on phlebotomy of Byzantine origin which can be compared to it.<sup>60</sup> The Byzantine letter on bloodletting was, however its origins are traced in future research, an introduction to this important surgical technique for early medieval western Europe.

Another didactic letter, which includes a primitive anatomy and a mutilated pathophysiological theory of concoction, belongs more in the class of

medicinae: Ein frühmittelalterliches Kompendium der Medizin," *Kyklos*, 3 (1930), 424 ff., and H. E. Sigerist, "Die 'Lectiones Heliodori,'" *SA*, 13 (1921), 146 ff.

<sup>54</sup> H. E. Sigerist, "Die 'Cirurgia Eliodori,'" *SA*, 12 (1920), 1–9.

<sup>55</sup> *Ibid.*, 8f. See also J. Kollesch, *Untersuchungen zu den pseudo-galenischen Definitiones medicae* (Berlin, 1973 [Akademie der Wissenschaften der DDR. Zentralinstitut für Alte Geschichte und Archäologie: Schriften zur Geschichte und Kultur der Antike, 7]), 39.

<sup>56</sup> See notes 52 and 53 above.

<sup>57</sup> Beccaria, *Codici* (n. 14 above), 451.

<sup>58</sup> Wiedemann, *Untersuchungen* (n. 21 above), 53–56.

<sup>59</sup> Scherer, *Epistula* (n. 21 above), 16 f.

<sup>60</sup> Diels, *Handschriften*, III, 49. See also R. Czarnetzki, *Ein Ad-erlasstrakt angeblich des Roger von Salerno samt einem lateinischen und einem griechischen Texte zur "Phlebotomia Hippocratis"* (Med. diss., Leipzig, 1919), 31 f.

<sup>47</sup> Beccaria, *Codici* (n. 14 above), 447.

<sup>48</sup> Wiedemann, *Untersuchungen* (n. 21 above), 67, and D. Blanke, *Die pseudohippokratische "Epistula de sanguine cognoscendo"* (Med. diss., Bonn, 1974), *passim*.

<sup>49</sup> Cf., for example, Oribasius, *Medical Collection* VII, 4.11 (ed. Raeder, I, p. 202) and *Synopsis* I, 9.6 (ed. Raeder, p. 10), based on Galen, *Bloodletting Therapy* 14 (ed. Kühn, XI, 291, 15 through 292, 5); but see also the one-page epitome on phlebotomy in Ideler, I, 293.

<sup>50</sup> Blanke, *Epistula* (n. 48 above), 21 f.

<sup>51</sup> E.g., Ideler, I, 409–29.

<sup>52</sup> See note 14 above.

<sup>53</sup> H. Schöne, "Zwei Listen chirurgischer Instrumente," *Hermes*, 38 (1903), 280–84. For the Latin text, see also R. Laux, "Ars

theoretical writings than many others previously discussed. This anatomical-coction letter is transmitted to the early medieval western tradition similarly to the manner of adaptation of the letter on bloodletting: the anatomy and coction letter is integrated into both Corpora I and II of the western tradition. Ten manuscripts dating from the ninth through the eleventh century, and four of later dates, suggest a widespread textual tradition.<sup>61</sup> The text itself is an adaptation of various sources. The poor anatomy of the digestive and respiratory organs appears to have been lifted from Latin sources of late antiquity—for example, Vindicianus.<sup>62</sup> Yet some indirect knowledge of Galen must be presumed, since the author shows a dim command of Galen in the passages where he treats humoral pathology and the theory of digestion.<sup>63</sup> This abridgment and deformed exposition of the theory is the basis of the author's theory of fevers, known since the time of Hippocrates.<sup>64</sup> Yet in his consideration of fevers, humoral pathology, and digestion, as well as in the following section on the four humors,<sup>65</sup> the author diverges more and more from Galen, and the anonymous writer discusses fevers in relation to the humors and the elements, employing the fevers to diagnose different diseases. Needless to say, the author's prognostic analyses do not occur in Galen. It seems that other sources were more important for this writer, perhaps sources which summarized and analyzed Galenic works. Such other sources can only be Byzantine, as shown for example by the author's connection of burning fever with a superabundance of yellow bile.<sup>66</sup> Thus one can presume other Byzantine sources for pathophysiological notions found only in this treatise.

It should be emphasized that these adapted texts do not represent the best works of Byzantine medicine. The short, little texts with truncated theory already present in their Greek originals (as compared with the Greek medical texts composed before the end of the second century) were the basic foundations in the medicine of early medieval Europe for pathophysiology, humoral pathology, surgery, therapy, and prognosis—for example, urognostics or hematoscopy. The summarization and epitomizing of medical knowledge found in this

aspect of Byzantine medicine, as well as the loss of the best tracts of Greek medicine from classical antiquity, are certainly major reasons for the low standards of medicine in western Europe in this era.

A basic question can now be posed: Were these adaptations of Byzantine medicine, mostly in the sixth century in northern Italy (belonging more, therefore, to late antiquity than to early medieval Europe) the only traces of Byzantine medicine in early medieval western Europe?

To answer this question it will be helpful to look at the adaptation of other aspects of Greek than medical writings, especially Byzantine literature in the West. One fact needs emphasis: almost nowhere in western Europe did there exist a tradition of Greek learning during these centuries.<sup>67</sup> Generally, there was knowledge of Greek by single individuals, or there were regions—southern Italy or Sicily—where Greek remained the mother tongue of part of the population, and which thereby were bilingual. A lack of a tradition of Greek learning applies also to the Irish savants of the eighth and ninth centuries, particularly those present at the court of Charlemagne: they had little interest in Greek or Byzantine medicine.<sup>68</sup> The sources which were integrated into the sevenfold *Physica*, following the *Quadrivium* in the Irish model of learning, were the encyclopedias of late antiquity, including Isidorus, and were Latin in origin.<sup>69</sup>

A major problem, however, for each intellectual development in western Europe had been whether it was possible to formulate a technical language in Latin which was as capable as Greek of abstraction. The creation of such a language always occurred when translations were made from Greek into Latin, and for the *Artes* and generally for philosophy, this had resulted with the translation of Greek philosophic texts, from Cicero to Boethius.<sup>70</sup> In this context, it is noteworthy that in early medieval times, the first Byzantine commentaries on Aristotle were transmitted to the West, and similarly there occurred transmission in theology to southern Italy

<sup>61</sup> Scherer, *Epistula* (n. 21 above), 31–56.

<sup>62</sup> *Ibid.*, 88–91, and 100 f.

<sup>63</sup> *Ibid.*, 91–95, and 101 f.

<sup>64</sup> *Ibid.*, 95 f. and 102 f.

<sup>65</sup> *Ibid.*, 96–99 and 103.

<sup>66</sup> Rufus (ed. Daremberg and Ruelle), 605, 26.

<sup>67</sup> B. Bischoff, "Das griechische Element in der abendländischen Bildung des Mittelalters," *Mittelalterliche Studien: Ausgewählte Aufsätze zur Schriftkunde und Literaturgeschichte*, II (Stuttgart, 1967), 246–75.

<sup>68</sup> G. Baader, "Die Entwicklung der medizinischen Fachsprache im hohen und späten Mittelalter," in G. Keil and P. Assion, eds., *Fachprosa-forschung. Acht Vorträge zur mittelalterlichen Artesliteratur* (Berlin, 1974), 93 f.

<sup>69</sup> B. Bischoff, "Eine verschollene Einleitung der Wissenschaften," *Mittelalterliche Studien. Ausgewählte Aufsätze zur Schriftkunde und Literaturgeschichte*, I (Stuttgart, 1966), 273–88.

<sup>70</sup> Baader, "Entwicklung" (n. 68 above), 90–93.



with Cassiodorus and the Vivarium, and to France with the translation of Pseudo-Dionysius Areopagita.<sup>71</sup> The state, however, for medicine in the early Middle Ages, was quite different.

For the further development of medicine another translation from the Greek became crucially important. At Salerno in southern Italy, a medicine of a higher level than elsewhere in western Europe existed through the entire early Middle Ages. In the eleventh century, archbishop Alphanus of Salerno—himself a medical practitioner—translated Nemeseus' anthropological tract *On the Nature of Man* into Latin, and its language was not that of Vulgar Latin. This translation became crucial in the development of medicine in western Europe because Alphanus created a technical language through his translation of Nemeseus' book, which was a combination of Byzantine theology and Galenic physiology, and now the Galenic medical Latin became capable of abstraction. This is one of the preconditions for the reception of Greek medicine in Arabic guise beginning at the end of the eleventh century in southern Europe<sup>72</sup> and elsewhere. This medical

language is that which Constantine the African could use to translate Arabic medical writers into Latin for the school at Salerno. The most important of these translations for medical education at Salerno and later are included in the first textbook of medicine, the so-called *Articella*.<sup>73</sup> In addition to the translation from Arabic into Latin, one finds in the *Articella* two translations of Byzantine medical treatises, rendered at Salerno in the eleventh century.<sup>74</sup> They are two diagnostic texts: the excellent urognostic compendium by Theophilus Protospatharius, and the unsophisticated manual of sphygmology by a certain Philaretus.<sup>75</sup> Theophilus and Philaretus were also rendered into the new technical Latin created by Alphanus from Byzantine Greek, and these translations mark a new age in Latin medieval medicine.

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<sup>71</sup> *Ibid.*, 94–96.

<sup>72</sup> *Ibid.*, 96–100. See also G. Baader, "Die Schule von Salerno," *Medizinhistorisches Journal*, 13 (1978), 124–45 (esp. 130 f.).

<sup>73</sup> G. Baader, "Handschrift und Inkunabel in der Überlieferung der medizinischen Literatur," in E. Schmauderer, ed., *Buch und Wissenschaft: Beispiele aus der Geschichte der Medizin, Naturwissenschaft und Technik* (Düsseldorf, 1969 [Technikgeschichte in Einzeldarstellungen, 17]), 23–27.

<sup>74</sup> Baader, "Salerno" (72 above), 134.

<sup>75</sup> Pithis, *Philaretos* (n. 23 above), 187–94.